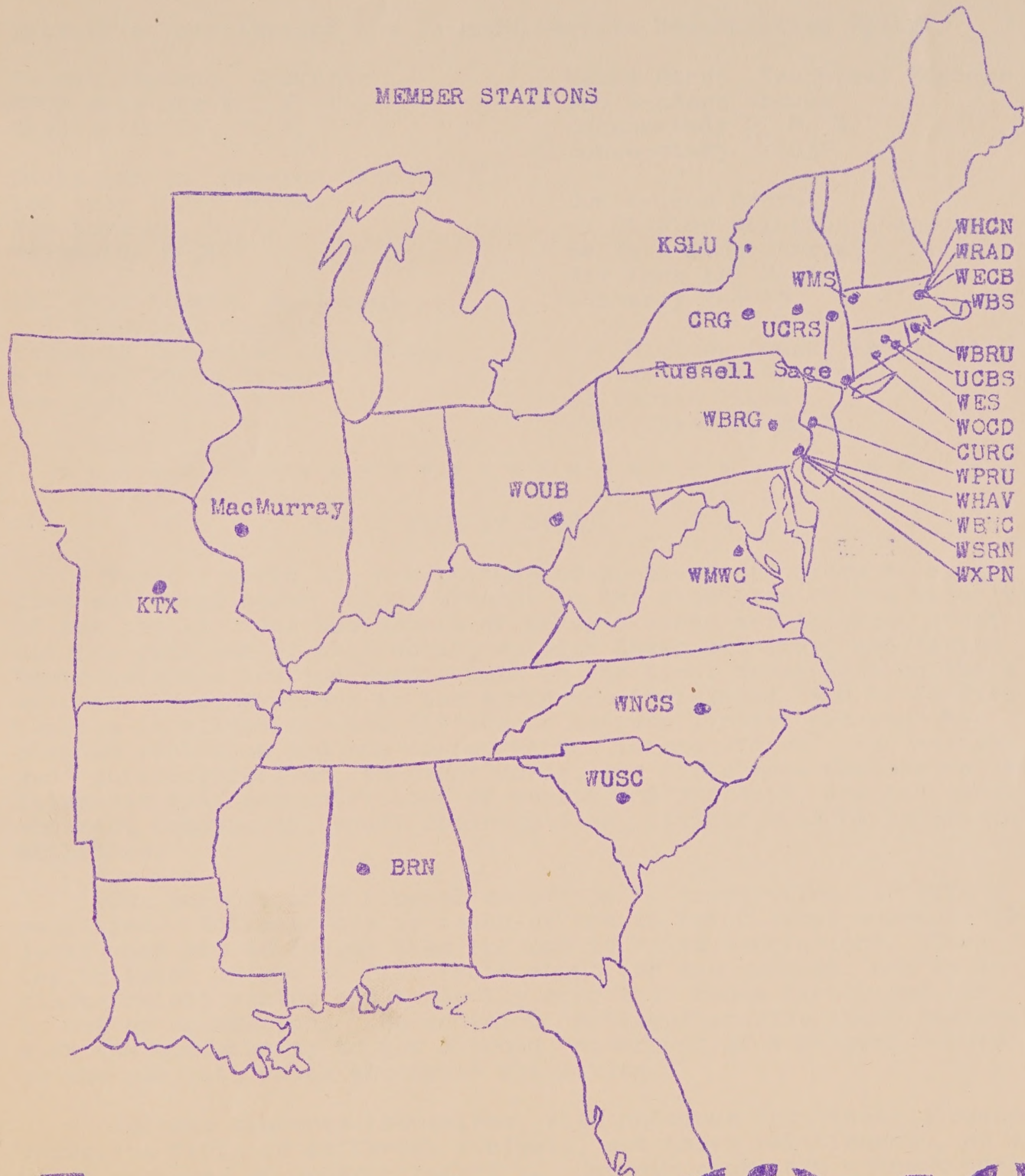


Technical Edition

I.B.S. BULLETIN

MEMBER STATIONS



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LET'S TALK IT OVER!

Today's world has a multitude of problems--problems of a variety and scope never before brought to the attention of the majority of the people. And the people of today's world are thinking about all the problems of this world, voicing their opinions, and making their opinions and judgements felt in the final decisions on these matters. Many problems in the world are influenced by a basic difference in viewpoint--the difference between liberal progress by planned evolution and the conservative "laissez-faire" and "status quo" philosophies; or, in other words, the difference between vested interests with concentrations of wealth and property, and the people who want unhampered, equal opportunities, limited only by individual abilities.

One purpose of a liberal education is preparation for life's realities. Colleges try to teach us how to think about various subjects, and how to reason them through to valid conclusions. They try to teach us how to find facts about any one subject; how to evaluate relationships and logically correlate these facts; and how to act on conclusions. In addition, colleges provide their students with the opportunity to get a broad background of a general nature on the subjects which encompass all living.

College students themselves, with guidance from their educators, correlate facts on different subjects, and their relationship, as well as on problems of general interest. Surveys show that a great deal of thinking is done about the world's problems, and that individual conclusions have been reached; however, few students get all the facts on any matter, nor do they have the time to do so on more than a few problems. Their opinions on any matter may be largely based on the words of

a professor, a respected friend, a favorite newspaper, or ideas which for many years have been repeated in the family circle. Nor, on the other hand, do more than a minority of students join discussion groups or read publications which give fairly complete and detailed facts and discussions on any problem.

The time for decision is with us. What is said and done today will determine the future of our civilization--progress forward, or decay, disintegration, and collapse. Discussion of the world's problems must be constant through all media of communication. Periodicals, books, and radio can all contribute to better understanding of the course of the world. A far-seeing station with a conscience about the world and its problems, and the role citizen-students will play in that world in the immediate tomorrow, can do a great public service to the campus by presenting interesting and well-prepared programs on all matters in the public eye. The type of program is comparatively irrelevant--dramatic, musical, round table, debate, speeches, and question and answer periods all fill the purpose. Programs of this sort will help prepare the students for the decisions they must make on world problems; in presenting them, the campus station is performing a public service to the students it reaches. In presenting the problems of the world, station prestige and progress will be increased; at the same time the station will live up to its important obligation, the obligation to present discussion of matters vitally concerning its public over its facilities.

* * * * *

The following letter was recently received in the New York Office.

Williams Network
January 11, 1946

Miss Sonia-Jane Brown
Intercollegiate Broadcasting System
507 Fifth Avenue
New York, N. Y.

Dear Miss Brown:

WMS finds it impossible to accept the clause in the program code concerning "race and religion." It is agreed that no broadcast should contain any material purposely inciting race or religious prejudice.

The second clause is poorly worded and therefore unacceptable, in as much as this would prohibit the discussion of controversial material which we feel we should give coverage, as an organ of public opinion. The question of prejudice is involved in many problems of current interest concerning the campus, state, and nation.

As an example, let us cite the problem of fraternities, which often includes racial discrimination. We feel that questions such as this one have to be discussed with equal opportunity given to both sides. The code already guarantees that this shall be done. In light of this we propose the following wording: "Stations shall not broadcast any material attacking any racial or religious group, or

(letter from WMS--continued)

purposely inciting race or religious prejudice."

Sincerely yours,

Lewis S. Somers, 3rd
Business Manager

This is the reply to Williams:

January 24, 1946

Mr. Lewis Somers, 3rd
Station WMS
Williamstown, Mass.

Dear Lewis,

Thank you for your very interesting letter. The codes have been passed by sixteen colleges so far (with fourteen being the necessary number for ratification), and are now in effect. This will be officially announced next week, after the final date for return of ballots. However, if WMS feels that it is necessary to amend the codes, a motion to this effect can be made at the next Governing Council meeting, or by mail as provided in the By-Laws.

The Program Code is not intended to prevent the discussion of issues involving racial discrimination, but only the presentation of material favoring discrimination. The present wording of this Code would allow discussion of questions like the position of fraternities if discrimination is not advocated as desirable by any participant. However, an interesting question is raised. We are all in favor of free discussion of controversial issues. And it is a laudable fact that IBS stations are free of the restrictions on certain discussions that limit standard stations. For instance, on standard stations the family and marriage are always treated favorably, as is religion. IBS stations cannot make attacks on the Catholic Church, but unlike standard stations, they can discuss the accuracy of the Bible; this kind of discussion is possible because the audience of an IBS station is limited and specialized. Regular stations cannot broadcast any kind of program, or discuss any topic, that would offend anyone in their varied audience.

The basic question which your letter raises is this: are there certain topics to which IBS stations cannot extend free discussion? Free discussion is not usually extended to questions which cannot be regarded as controversial; i. e., where generally accepted facts exist. No one is privileged to utter untruth on the radio under the guise of free discussion. An attempt was made recently by an organized Atheist group to prove that Religion was a controversial issue, and they should, therefore, be given time on the air equal to the time used by religious programs. In this case, scientific fact cannot be said to exist, but the desirability of organized religion is held by such a majority of the public that the stations consider it "generally accepted." Religious groups which use the airwaves

(letter to WWS--continued)

are not permitted to attach other religious groups, nor even to imply that their form of religious observance is superior to others. Religious broadcasts must emphasize harmony among all faiths.

Whether white men are innately superior in intelligence to people of other "racial" groups is a topic hardly controversial in the light of scientific evidence. There are many questions which stations do not allow to be discussed for reasons of policy--in cases where public pressure is such that free discussion might reflect unfavorably upon the station and upon the radio field. In college stations there are fewer topics of this sort; but an unbiased discussion on the advantages of "free love" probably would not reflect favorably on any campus station. The prohibition against liquor, horse-racing, and similar advertising in the Business code is a result of the same desire to protect the stations against unfavorable public opinion.

A medium of communication cannot be completely unbiased, any more than a group of individuals anywhere can be. A position of authority in any communication medium entails a double-edged responsibility--the management is obligated not to inflict its opinions on the public; it is also obligated to present issues which vitally concern that public.

The actual discussion or lack of discussion on some questions constitutes a bias. Avoiding contact with controversial issues does not show a lack of bias, for it is essentially prejudice in favor of the status quo. Discussions on subjects of interest to the public are necessary in a democracy, and it is the responsibility of all organs of opinion to promote such discussions. But discussion should never favor, nor even present, a point of view which advocates violence, or social, political, or economic disadvantage toward any group in that democracy.

A station should not permit the use of its facilities for the presentation of any material which is not, in the considered judgment of the station authorities, in the public interest. Material which denies the basic tenets of our government would fall in this category, and the broadcasting of such material would reflect unfavorably upon the station, the System, and the field of college radio.

In other words, we feel that while you may discuss the causes of prejudices, you may not present arguments in favor of racial or religious discrimination, nor allow them to be presented over your facilities.

Any station's representative may initiate action either by mail or in a meeting of the Governing Council to change the provisions of the Codes of Practice, but it is our opinion that the present provisions of the Program Code will best safeguard the present and future of college broadcasting.

Sincerely yours,

Sonia-Jane Brown
Station Relations Manager

David Linton
Program Manager

The following appeared in this week's magazines after the preceding exchange of letters. It is from the CBS advertisement "LISTEN", dated January 26, 1946:

"In his concern for the future of international broadcasting, Edward R. Murrow speaks with the weight of nine years of intimate contact with Europe's people and their problems. Columbia's former European news chief is now back home as vice-president in charge of the network's news and public affairs broadcasts. This is Murrow speaking, in Variety's recent anniversary issue:

"...All the way from Ankara to Buenos Aires there will be people with shortwave receiving sets who are not only listening but trying to make up their minds. It would seem to me to be necessary that the voice of America should be clear and strong; that existing transmitters and available frequencies should be used in such fashion as to permit these people...to hear an accurate report not only of the news, but of what our country stands for in the field of entertainment and enlightenment.

"I don't believe for a minute that international broadcasting is going to save either the peace or the world...It is no part of radio's job in the international field to advocate policies or produce easy remedies. But there does rest upon those who control this instrument of communication...an almost terrifying obligation to inform the listener of what is happening in foreign lands....

"Radio...can offer an international platform for those who desire to debate current issues and controversies, the outcome of which will determine whether we shall have another war or whether we shall have peace. The contribution that radio can make is to see to it that those who want to listen can hear the issues debated and decided."

NEWS FROM THE COLLEGES.....

Station UCRS, Union College

The staff at Union College has been quite busy this semester. Most important activity was the election of officers for the coming semester. They are:

President--George Abbott
Vice-President--Roy Vandenberg
Program Manager--Walter Toner
Technical Manager--James Ozelsby

There are now announcers on duty at all times, so that control operators do not have to do double-duty, as happened during the war. Among the new programs are a sports quiz; weekly broadcasts of the college dance band are contemplated.

The station's frequency has been moved from 650 to 640 kc, to avoid a severe heterodyne. A new transmitter is under construction, with careful power supply regulation, so that frequency stability will be excellent. Plans have also been made to add a new amplifier and modulator to the present studio amplifier. The station has a new studio in use, and is originating most live programs from it.

NEWS FROM THE COLLEGES.....

Husky Network, University of Connecticut

The Husky Network (formerly station UCBS) at the University of Connecticut, has been readmitted to IBS in Trial Status. The Husky Network was a charter member of IBS, having joined the system on its founding in 1940. The station became inactive in the summer of 1943, because wartime conditions made continued operation impossible.

The equipment of the original station, with additions to increase the coverage, will be used. Hours of broadcasting will be 7 to 8:30 AM, and 4:30 to 10:30 PM, Monday through Friday. Programs will include news items, music, campus programs, and others "of interest to the students." Present staff is as follows:

Station Manager--Daniel J. Harris
Edwin J. Stratton--Business Manager
Andrew Arcelaschi--Ass't Business Manager
Edwin F. Collins--Station Engineer

Station CURC, Columbia University

Station CURC is renovating its quarters, and plans to have the work completed by the beginning of next term. A new piano has been contracted for, on a monthly rental basis; soundproofing is being installed to improve the quality of the piano and other musical programs. Painting of the studio will be completed, as well as the control room. In addition, control board, turntable, and other shelving will have a new linoleum covering, with stainless steel edging for resistance to wear. Station coverage is being increased, with lines to Teacher's College and Johnson Hall about to be installed.

The station officers for the coming semester will be:

President--Tak Kako
Program Director--Bob Hersh
Production Director--Lou Gordon
Engineering Director--Alan Sobel
Business Manager--Henry Katz
Personnel Director--Jean Connors

Station WPRU, Princeton University

The station at Princeton has recently been quite busy expanding its studio facilities. In a recent letter to the alumni of the station, President Paul Schumacher outlined the work that has been done since the station went back on the air in March. When broadcasts started, one studio was only partially completed; now this is complete, and another is being finished. The station staff has gained much experience since then, the letter continued, and is now presenting programs like the old ones. The station's status at the University is now very bright, as it enjoys unprecedented prestige with the administration, and has more and more students taking an active interest. At present the largest projects are having the station incorporated, and completion of the studio plans. The letter finished with an outline of future plans, and of the personnel policy.

News of the Radio Industry....

NORMAN CORVIN will direct the first program in the revived Columbia Workshop over CBS on Saturday, February 2, and 2:30 P.M. The memorable Workshop made historic contributions to radio's development as an intellectual medium, brought Corwin, MacLeish, and many others before the public. Revival of the workshop may be the first flowering of new CBS policy following recent reshuffling of executive posts.

Scripts definitely planned for the series include "Anniversary" and "Lee Fountain Jones of Age" by Joseph Quercoll; "Balzac Murder" by Joseph Lochman; "Interview" by Bryna Ivens; "Caesar," a verse drama by Bruce Stauderman; "The Turn of the Screw" by George D. Griffin; and "The Hooker's Canary" by Rick Landen.

FEDERAL TRADE COMMISSION expects an upswing in false and misleading radio commercials in 1946. The commission reads an average of 4,263 pages of script every day, and calls 10% doubtful. FTC expects a general increase in advertising now that companies have something to sell, with a proportionate increase in fraudulent claims.

ORGANIZED LABOR is getting a chance to say its say on the airwaves. ABC, for example, carries a show called "Labor-USA" Saturday evenings from 6:45 to 7:00 PM. The CIO is running the show currently, and the AFL will take over later. Immediately following on the same net is "It's Your Business" sponsored by the National Association of Manufacturers. Each side gets an uninterrupted quarter-hour with the listener as judge. Up to now, the CIO is coming out on top. The Big Business austerity of NAM is no match for the warm human Ballad-singing approach of the CIO.

CBS is airing "Cross-Section--CIO" as a sustainer on Saturdays 3:45 to 4:00 PM. Premier program of the series originated in the strike kitchen of General Motors pickets, and presented interviews with several rank-and-file members. CBS sticks to the policy of giving, rather than selling time for broadcasts on controversial subjects, despite reversal of the National Association of Broadcasters' rule to that effect.

THE RADIO DIRECTORS GUILD is going to award "mikes" similar to Hollywood's "Oscar's" for the outstanding radio performances of the period past. Radio people are often forgotten men, their efforts dissipated in the ionosphere. RDG's mikes will be handed out at an annual ball in March or April to the actors and actresses having turned in the best performances in each of several categories. Directors themselves will not be included, as they are doing the voicing.

ALBERT CREWS, former head of NBC production in Chicago and author of "Radio Production Directing" (which should be the bible of every student radio group), is teaching radio at the Army University at Biarritz.

Building New Studios

Now that building materials show promise of becoming available and station staffs are increasing, almost every station is taking plans to augment or at least refurbish its studio facilities. A thorough consideration of the theory involved should be a preliminary to actual design.

The studios themselves are only one part of a station installation. The control rooms, offices, workshops, and other auxiliary spaces must be considered, and the problem of access is important. Every studio and control room should be accessible without having to go through another room. A door should never open directly from a control room to a studio or from one studio to another, for obvious reasons. Similarly, a workshop should not be placed where noise made by it will find its way into the broadcasts. Control rooms must command an adequate view of all parts of the studio.

Every studio should have its own control room. Although the practice of using a single control room with two studios is common in smaller standard stations, it does not really result in a saving of equipment because one studio may not be used for broadcasting while the other is used for rehearsal (unless, of course, the director and engineer of one of the shows use earphones, which provide a poor picture of what a broadcast sounds like). In most cases, this arrangement wastes space, as it restricts the use obtainable from the studios.

Programs which do not require rehearsal or prior set-up usually do not require a studio. They can be conducted from an announcing booth, which can well adjoin and be controlled by Master Control. All large programs should have their own engineer, separate from the Master Control engineer, who can rehearse with the show and carry it through the performance. It is sometimes an advantage to have a booth adjoining the control room of a large studio, to be used for items of the program which should be isolated from the main body of the show.

Control rooms need not be large, in fact a large control room often encourages congregations of unnecessary people there. Five by eight is ample for a studio control. A master control should be somewhat larger. Workshops should definitely be separated from the control room.

Traffic control is also a problem to be considered. Visitors and members of the studio audience should not have to trip over other parts of the station in getting to a large studio, but idle wanderers should find it difficult to get into Master Control or any control room. At WSRN, Swarthmore, the studios are on the first floor as one enters the building. Master Control, offices and workshop are on the floor above where visitors seldom penetrate. One of the proposed plans for WPRU, Princeton, places Master Control with entrance through the station office.

In the choice of a location for any installation, the existing sound level is an important consideration. It is not necessary to locate a transmitter below ground level for shielding, as was once thought, but many stations have found basement space easier to come by than space above ground. Thick stone walls may be an advantage in cutting down sound from the outside, and a concrete slab floor overhead is probably as soundtight as any possible construction. Gurgling steam pipes and nearby machinery can render any program spine-tingling, but they're hard to bring in on cue. A noisy location can be considerably improved by building isolated inner walls, similar to the double partitions between rooms.

"Soundproofing" is an unfortunate term which confuses the problems involved in designing studios. One problem is to keep the transmission of sound from outside the studios and from adjacent rooms below the noticeable level. Another, entirely different problem is to control the sound conditions within the room so as to avoid "boominess" or echoes and at the same time to avoid the dead sound of an over-absorbent room.

Sound travels through walls in two ways. Some of it is "airborne"--variations in the air pressure. Airborne sound passes through very porous materials, but most sound transmitted through walls is "solid-borne." The sound pressure causes minute vibrations in the wall itself, which are re-converted into sound on the other side. This is similar to the effect of hitting a pipe with a hammer. The sound is heard all along the pipe, even at considerable distance. Sound travels more readily through solids than through air. The sheer mass of a wall has considerable effect on its sound retarding characteristics, but structural and cost limitations make it generally impractical to build heavy walls for studios. The usual recourse, therefore, is to build a double wall which is essentially two thin walls with no direct connection between them. Walls of cinder block or hollow tile are excellent, but where cost considerations are very important a partition consisting of two 2 x 2 wooden frames covered with plaster board will provide good isolation at lowest cost. An unsupported sheet of porous wallboard between the two frames will catch airborne sound, and the hard surface of the plaster board transforms most of the sound into vibrations in the wall itself. Windows should be double and of heavy polished plate glass, one window in each section of the double wall. The connection around the frame should be made by a non-rigid material. Ceilings and floors may be similarly isolated, by avoiding mechanical connections between the frames where possible and using shock-absorbers of felt, sponge rubber, steel springs, or fibrous wallboard where connections are unavoidable. In most installations the studio walls, floor, and ceiling are all connected rigidly together, but isolated from the frame of the building and from adjoining surfaces. More complete information and drawings will be available from IBS.

The control of sound conditions within the room is the other important problem. Probably the most important factor is the shape of the room. Sound has a tendency to resonate in cavities whose length is an integral multiple of the wave length of the sound. The bathroom baritone finds certain notes which make his voice sound more full and masculine. Technically, he is simply exciting a mode in the room response. A peak will occur in every octave, since the

wave-lengths are integral multiples. It is important that the dimensions of a room be so chosen that the resonances in different planes (usually three) do not occur at the same note or notes close to one another. The dimensions should, therefore, be related as the wave-lengths of notes one-third of an octave apart, or as the cube root of two, since this provides the maximum possible separation of three points in the octave. Permissible dimensions are in the ratio of 1: 1.25: 1.6 or any integral multiple of the last two, such as 1: 1.6: 2.5 or 1: 2.5: 3.2. The allowable deviation for good acoustics is about 5%. The consideration of studio shape should be the primary consideration in any studio layout. No amount of sound-absorbing treatment will correct a room whose shape is wrong. The placement of walls separating the control rooms from the studio should be determined so as to render the studio shape correct, and the height of the ceiling should be adjusted as necessary.

If walls are not parallel, there are a large number of resonant frequencies in each octave, and the diffusion of sound is more complete. This is the principle used in studios with slanting walls, odd angles, and ceilings of different heights. Sections of wall which are angled or scalloped are often used. The more complete application of the theory is the polycylindrical diffusion recently used in several installations. Sections of the cylinders from two to six feet wide are used to line the walls, the axes of the cylinders on the walls and ceiling being mutually perpendicular. The cylinder is, of course, an infinite number of plane surfaces at different angles. Tests in rooms treated this way have shown that the diffusion of sound is better than can be obtained with other methods of sound control. The latest extension of this theory is in one studio at NBC where the walls are covered with sections of spheres. It has not been shown, however, that the spheres have any advantage over polycylindrical treatment.

In addition to controlling the resonance in a studio, it is necessary to control the reverberation time; i.e., the time that a sound persists above a certain level after the initial source is silenced. The classic method of studio treatment was to cover the walls with heavy absorbing material, which would absorb much of the sound and reduce the reverberation time. This results in a "dead" sound, and many old studios were damped far too much. Studio PH at NBC was an example before the acoustics were corrected with polycylindrical treatment along the back wall of the stage. Recordings made there by Toscani and the NBC orchestra in the old days were noted for their lack of brilliance and poor definition.

It is inherent in sound absorption of the type employed that the high frequencies will be absorbed more than the lows. In order to attenuate low-frequency "boom" sufficiently, it was often necessary to reduce the highs far too much. This became particularly objectionable with FM, where frequencies up to 15 kc can be transmitted. Luckily, the polycylindrical treatment tends to absorb low frequencies because these frequencies cause the panel to vibrate, and the cylinders can be treated with a glossy hard surface which will reflect the highs. In most modern studios, combinations of these methods are used, small studios employing some absorbing material in addition to cylinders; larger studios employing splayed walls and ceilings, absorbing materials in the chairs (and the audience) and cylinders on the stage.

One other advantage of the cylindrical treatment is its low cost. The panels can be made of ordinary one-fourth inch plywood bent around forms bandsawed from ordinary lumber. Any carpenter or ingenious student can make them. The cost of materials can be computed at about one-fifth the cost of conventional treatment with rock wool covered by perforated metal or hard-surfaced board. The computation of exact requirements for the treatment of a room involves application of specialized formula and a good deal of guess work. It is never possible to determine in advance exactly what the results will be, but substantial progress is being made in that direction. Some few corrections are usually necessary after the designs have been carried out.

In general, new studios should be designed with the following points in mind:

1. Choose a location where the existing noise level is low.
2. Lay out the rooms with regard to studio shape, access, sound control, traffic control, visibility from control rooms, and convenience.
3. Isolate all interior walls, control room floors if elevated, and other floors and ceilings where necessary.
4. Avoid parallel surfaces in studios. Allow sufficient height and width for application of cylindrical sections.
5. Be sure that control rooms have reasonably good acoustics, as monitoring must be done there.

More detailed information will soon be incorporated into the Technical Data Book, but as the problems of each installation are different from others, all stations are invited to consult IBS about their particular requirements.

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The following letter was received late in December:

Dear Miss Brown:

I wish to thank you, and through you the member stations of I. B. S., for your very thoughtful and much appreciated Christmas present. I enjoy Fortune Magazine very much and I am happy to know that I will be getting it again this year.

Sincerely yours,

Joseph J. Reed

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WPRU at Princeton has come up with a good idea. They are having telephones installed in the rooms of their key officers to insure quick communication. The University has no coordinated telephone system, so the station's phone, like those of the officers, go through the town exchange.

The WELLESLEY COLLEGE NEWS for January 17 has the following note: "If you want someone else to do your record changing for you, get in touch with Marie Bransfield (President of VBS) who will have your records picked up, played on VBS, and returned immediately." That's what we call serving the community!

The Control Engineer

One of the indispensable functions in all broadcasting is that of the control operator. In many cases, too little attention is paid to the importance of this job and the station's programs suffer in consequence.

If a control system is properly designed, the operator need not know the engineering theory or design of his equipment; a good ear for program quality is a much more important prerequisite. The technical background required includes a knowledge of microphones and studio acoustics in so far as they affect the arrangement of the studio. The control operator and the director decide up on the studio set-up, and throughout the rehearsals and broadcast, the operator is responsible for the absolute level of all sound and the proper balance between elements of the program.

This is an important consideration. One of the limitations of amplitude modulation (as opposed to FM) is that it requires compression of the volume range on most sounds. The maximum level of sound which can be transmitted is limited by the equipment, and the minimum sound level is set by the background noise, always present in standard transmission, which drowns out softer sounds. Within these narrow limits, the operator and director must strive for smoothness and dramatic effect. In dramatic programs, the perspective between foreground and background sounds must not be lost. One of the signs of poor control engineering is over-compression, in which all elements of the program are exactly the same volume. The announcer makes as much noise as a full symphony orchestra, and the whisper of the dying hero blasts forth equally with the roar of an angry mob.

These signs of incompetence are not unavoidable, but they appear in many stations. It is a good rule to hold the voice of the announcer on musical programs at least 2 db below the music at all times. DB and VU meters are limited in their sensitivity, and a control man must rely chiefly on his hearing of the sound from the monitor as a measure of program quality. The meter will indicate volume on an absolute scale. This is one of the reasons why good quality monitoring equipment and separate control rooms for each studio are necessary.

The engineer is responsible for accurately coordinated timing in his work. He must open mikes just before, not just after, the beginning of a speech, and close them immediately after the end. On dramatic or variety programs, the same control man must follow the show through all rehearsals and the actual broadcast. He must follow and mark his script as carefully as the actors do theirs, but his markings consist of the number of the mike to be opened, the level of each sound, and the approximate volume settings.

Where the control man also plays records, he is responsible for keeping dead grooves--those not containing sound--off the air, bringing the music in on cue and playing long symphonic recordings without breaks between records. An audition or phono cue circuit usually permits the operator to set up records in advance so that they may be brought in exactly at the beginning, but only practice will enable the operator to cue records accurately every time. The operator should remember

that recordings, particularly of serious music, are compressed in the recording, and further compression, by reducing the volume on loud passages and increasing it in quiet passages, will often detract from the effect of the music.

Operating a master control requires more technical knowledge. The master control operator's job is like that of a traffic policeman--he directs the programs to and from other points, and maintains a check on all traffic that goes through his board. The Master Control operator may adjust the absolute volume of a program if necessary, but he can never control the balance of program elements; only the operator at the point of origin can do that. A good deal of the Master Control operator's work is concerned with programs not on the air--the following ones. He usually checks with each point of origin before it goes on, and communicates with all remote points and provides them with cues.

Operating on remote locations has its unique problems, too. Here the operator has less control over his environment than in the studio, there is often an audience to contend with, his equipment, which must be portable, is less complete, and in the case of special events he may have very little advance notice before the broadcast. Background noises in outdoor locations, echoes from large auditoriums, and crowd noises at dances all make the remote operator's job harder, but correct selection and location of microphones combined with considerable ingenuity can solve almost any remote problem. Not the least of these problems is getting the remote amplifier, microphones, stands, tools, and miscellaneous equipment to and from the point of origin.

The good control operator is a combination of technician and artist; an important member of the station staff who deserves more recognition than he usually gets.

David J. Boret

David Linton

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Hands Across the Sea

For those who've been looking for a dramatized news program we would like to suggest the "Transatlantic Radio Newsreel" of the British Broadcasting Corporation. Intended particularly for rebroadcast by stations in this country, "Newsreel" combines late news reporting with short dramatizations and on-the-spot recordings of news being made. Latest reports on the London UNO conference can be expected on "Newsreel" nightly.

"Radio Newsreel" is fifteen minutes long; it is presented at 7:30:30 and 11:00:30 every night, including Saturday and Sunday. The program starts thirty seconds after the hour, giving you time to make an introductory announcement and say "We take you now to London" before they chime in with "This is London calling..." BBC also gives Greenwich time signal every hour so you can keep your clocks synchronised with theirs.

BBC's Daventry transmitters flood the United States with signal on 9.25, 7.26, and 6.11 megacycles; good reception can almost always be had on at least one of these channels. BBC will give permission to rebroadcast; IBS will secure this for you.

Listening Survey

IBS and IBSR are cooperating in the preparation of a uniform listener survey, to be conducted at all colleges having full member stations. The cooperation of member stations will be enlisted to provide student interviewers to ask the questions, and in return each station will be provided with a complete tabulation of its own listening audience and of the entire national college audience.

This poll has been pre-tested at Princeton; it will be ready to be given at the other colleges shortly after the beginning of the spring semester. When results from all twenty IBS colleges are in, the sample polled will be over 2000--a figure that compares favorably with the samples used by national polling organizations.

On the basis of the preliminary poll at Princeton, the final form of the questionnaire will be made up, and the same questions will then be asked in all the colleges--with room, of course, for any additional questions that interest individual station staffs. The poll will ask about general program preferences of the college student, extent of radio ownership and radio listening, favorite stations, attitudes toward the college station and reasons for these attitudes. This first large poll is intended to provide basic information, obtained/scientifically sound and reputable methods. by

The questionnaire is to be administered by student interviewers on each campus, who may or may not be members of the station staff. The sampling will be done on a random basis, making sure that all important segments of the college population are properly represented. Detailed sampling instructions will be worked out for each college individually, depending on the circumstances involved. The results will be tabulated by automatic machines in New York; following the final analysis, a full report will be published.

The survey is being arranged for IBS by Harriet Linton, wife of Program Manager David Linton. She is taking a busman's holiday from her job at the Office of Radio Research, Columbia's University's opinion study organization. The IBS office will work out the specific plans for each college with the person in charge of the poll for the member station. IBS is now able to offer its members advice on any other polls that any station wishes to undertake. Any station that wants advice on polling problems--framing of questions, sampling, interviewing, or analysis--should write to IBS, stating the problem and plans.

ATTENTION, WRITERS!

The Mutual Broadcasting System announced on January 30 the opening of "The Carrington Playhouse." Mrs. Elaine Carrington, well-known script writer, and the Mutual Broadcasting System have joined together in a search for new writing talent. Only scripts by unknown radio writers will be used. The search for new talent in the field of dramatic radio writing has long been discussed; this present series represents concrete action.

This particularly offers an excellent opportunity for would-be professional writers on IBS station staffs. All original scripts accepted for the series (to be produced by Mrs. Carrington) will be purchased by Mutual for \$200, and broadcast on the national network; in addition,

Mrs. Carrinton has offered a prize of \$500 for the best script in each 13-weeks series. The series will begin on Thursday, February 21 (8:00 to 8:30 PM, EST).

Further details will be included in the next "Please Post."

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BALLOT RETURNS

The returns on the ballots sent out January 7 are as follows:
(note: 16 ballots were returned from 20 Member stations; one college which did not return its ballot voted on the motions in meeting December 29).

Codes: For adoption--16
Against adoption--1
No return--3

Admission of station WECB to Affiliate Status:
For admission--17
No return--3

Establishment of nominating committee for Board of Directors:
Approved--16
No return--4

Elections: The following people have been elected to serve as the IBS Executive Committee for the year 1946:
Chairman--George Abraham
Technical Manager--David Borst
Program Manager--David Linton
Station Relations Manager--Sonia-Jane Brown

CODES: The codes went into effect on January 28, the date they were adopted by two-thirds of the Member Stations. Within one year of adoption--that is, by January 28, 1947, Member stations must comply with all of the provisions of the Codes, under penalty of forfeiting Membership and reverting to Trial Status, by direction of the Governing Council. Copies of the Codes, suitable for binding, will be sent to all IBS member groups shortly.

STATION WECB: We are pleased to welcome Station WECB as the newest Affiliate Member of IBS, and hope that they will soon become a full Member station.

BOARD OF DIRECTORS NOMINATING COMMITTEE: The following committee has been approved to nominate candidates for the IBS Board of Directors, and to contact candidates about their willingness to serve as members of the Board:

Daniel Weinig (Yale)--Chairman
William Lippman (Harvard)
Robert Currie (U. of Pennsylvania)

Suggestions to this committee about qualified candidates will be welcomed.

Elections for the Board of Directors will be held at the May meeting.

Studio Equipment

Members of the IB3 Program Equipment Advisory Committee have met recently with representatives of a manufacturer of electronic equipment to discuss specifications for studio control panels, amplifiers, and monitors suitable for college stations. If satisfactory specifications are arrived at, the equipment will be recommended to IB3 stations who wish to buy rather than build equipment. This should aid women's colleges and those with a shortage of technical help. The prices will be considerably below those of standard broadcast equipment, and a discount will be offered to member stations of IB3. Units are now in the blueprint stage, and should be in production by April.

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COVER: This month's cover shows the location of IB3 member groups as of January 31, 1946. Unfortunately, we could not show the location of station BYU, Brigham Young University, Provo, Utah, because of lack of space.

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AS WE GO TO PRESS.....

A letter was just received from Harrison Wroton, the head of the Trial station, WNCS, at North Carolina State College. He said that the operating staff of the station had been organized to begin regular broadcasts. The transmitter was tested the weekend of January 25th; regular campus-wide broadcasts were to start around February 10th. The station will broadcast Monday and Wednesday evenings, from 9:30 PM to midnight. Programs will include popular records, sports, classical music, "Campus Commentary," records featuring one band, and a UP news summary.

The station has obtained a 16 inch transcription turntable, enabling it to broadcast any kind of transcription or record.

Our hearty congratulations to the staff of WNCS! May their operations be successful!

TECHNICAL EDITION

NOTE: The following pages are added to the Bulletin to form the Technical Edition, which is of special interest to Technical personnel.

Installation of Wave Filter Eliminates Troublesome Harmonics

Operation of the transmission system at WSRN, Swarthmore, has been improved by the addition of a filter which eliminates harmonics formerly appearing in their transmissions. The filter was designed and installed by Clement Moritz, IBS Technical Advisor.

WSRN operates on a frequency of 640 kc. but to obtain greater stability the oscillator is operated on 320 kc. The output of the oscillator is multiplied by two to obtain the desired 640 KC carrier, but considerable power on three and four times the oscillator frequency, namely 960 and 1280 kc. was also present in the transmitter output. Both of these harmonics lie in the broadcast band and could cause interference with other stations as well as cause confusion to the listening audience.

When it was decided to try to eliminate these harmonics, two means of solution were considered. The transmitter could be re-designed for better harmonic suppression, or a wave filter could be installed at the transmitter output which would prevent transmission of all frequencies except the desired frequency of 640 kc. The latter approach was tried first because it was not necessary for the station to leave the air in order to make the change.

The impedance of the r.f. lines system was measured at the transmitter and found to be 130 ohms. A 130 ohm pi type filter was first considered, but it was found that harmonic suppression was not sufficient. A modified pi type filter was then devised, with the series element converted into a parallel resonant tuned circuit which would block the passage of 1280 kc. power, and the second shunt element converted into a series resonant circuit which would short power at the 960 kc. frequency. Constants were calculated, and then built up in the laboratory. The coils were measured using a Q meter, 1% tolerance silver mica capacitors were assembled in parallel to obtain the values desired. The elements were assembled and wired, and a response curve was run using a signal generator and vacuum tube voltmeter. Rejection of the two unwanted frequencies was almost complete, while 98% of the energy at 640 kc was transmitted through the filter.

The filter was installed and worked satisfactorily without further adjustment. Mr. Moritz describes its operation as follows:

"Before installation output at 960 kc. and 1280 kc. was almost as strong as at 640 kc. After installation 960 and 1280 kc's have disappeared and are inaudible even in the same building.

"It was found on installation that because of the impossibility of loading at null points, the loading could be increased at 640 kc. with an increase in transmitter output."

A filter of this type can be worked out for any transmitter frequency, knowing the impedance of the rf lines system, and to reject any harmonic frequency or frequencies. Details of construction and methods of measuring the r.f. lines impedance can be obtained by writing the Technical Department.

David W. Borst, Technical Manager

Choosing the Operating Frequency for a Campus Broadcasting System

One of the important decisions involved in building a campus station is the choice of the operating frequency. Early in the operation of the station a frequency must be found which is a wise choice and won't require future changes with resulting confusion to the listeners.

Paragraph a. of the recently approved Technical Code for IBS Member Stations restricts the frequencies of unlicensed college stations to the range 540 to 700 kc. It is on these frequencies that operation without illegal radiation is most easily obtained in practice; furthermore, the lowest suitable frequency within this range is best.

Limiting the choice of frequencies to those at the low end of the band is no real hardship; in most communities there are several suitable channels available. Of the 24 frequencies now used by IBS stations, 21 are in the 540 to 700 kc. range. The favorite channel is 640 kc., with nine stations using it. Other frequencies used by two or more stations are 580, 600, 620, and 730 kc.

Paragraph b. of the Technical Code specifies that the frequency chosen should be at least 20 kc. away from a station which is received on the campus with a signal of local-station strength (500 microvolts per meter minimum level), and at least 10 kc. away from any station having a usable signal (100 microvolts per meter minimum level). This rule will prevent locating so near a local station that it will blanket the campus station, and will also prevent interfering with a distant station which can be received well enough to be of interest to certain listeners.

Section TI 1101 to TI 1108 of the IBS Technical Data Book describes how to survey the radio channels in your locality to determine which are most suitable. Also, this section lists all the standard broadcast stations between 550 and 690 kc. This listing will soon be revised to include Canadian stations. This list should be studied when selecting a new or different operating frequency.

Recent Technical Articles

The following recent articles appearing in popular technical publications and arranged according to subject, are of interest to the technical staffs of campus stations.

Audio Amplifiers

Audio Mixer Design	Electronics	June 1945	p 120
Push Pull and phase inverters	Radio-Craft	March 1945	p 354
Volume expander design	Electronics	December 1945	p 124

Audio, Control Circuits for
Automatic fader

Electronics	October 1945	p 119
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Audio, General Considerations

Sound units and sound ratings	Radio-Craft	May 1945	p 488
Electrical Acoustical equivalents	Communications	June 1945	p 44
Audible Audio Distortion	Electronics	January 1945	p 126

Audio, Equalization

Equalization and Compensation	Radio-Craft	April 1945	p 423
Tone compensators using tuned circuits	Radio-Craft	May 1945	p 491
Circuit equalization	Radio-Craft	March 1945	p 348

Broadcast Equipment

Refer to series of articles in Radio-Craft beginning with issue of September, 1944

Broadcasting, General considerations

Broadcast listener acoustic preferences	Proceedings of the I.R.E.	September, 1945	page 71
Dynamic range in Broadcasting transmission		February 1945	p 16
	Radio News (Electronic edition)		
Higher Fidelity broadcasting	Radio News (Electronic Edition)	May '45	
Wide-Band Program Circuits	Electrical Engineering	March '45	p 99

Circuit Analysis

The Cathode follower	Radio News	February 1945	p 54
Cathode Followers and Low Impedance Plate-Loaded Amplifiers	Communications	March 1945	p 51
Pi Network Calculators	Electronics	May 1945	p 140
Negative Feedback Part I	Radio-Craft	August 1945	p 702
Part II	Radio-Craft	September 1945	p 777
Resistive attenuators, Pads, and Networks -			
refer to series of articles in Communications beginning with August 1944 issue.			
R-C Filter Chart	Electronics	November 1945	p 164

Frequency Modulation, General Considerations

FM Distortion caused by Multipath Transmission -	Proceedings I.R.E.		
		December 1945	p 878

FM Standards of Engineering Practice FM & Television October 1945
page 28

FM Handbook - series of articles in FM and Television beginning
with February 1945

Microphones

Microphone Input Circuit Radio News January 1945 p 49

Phono Pickups

Calculation of Distortion due to Phono Needle Wear Electronics July 1945 p 250
Crystal pickup compensation circuits Electronics November 1945 p 128
Results of Phono needle tests Radio-Craft November 1945 p 99
Tracking Angle in Phono pickups Electronics March 1945 p 110
FM Pickup Radio-Craft November 1945 p 106
Moving Coil Pickup Design Electronics June 1945 p 108

Plastics

A review of Plastic Materials Proceedings of the I.R.E. December
1945, page 825

Power Supplies

Basic Theory and Design of Electronic Power Supplies Proceedings of the I.R.E. July 1945 Page 478
Two Voltage Regulated Power Supplies Electronics October 1945 p 25
Voltage Regulated Power Supplies Communications November 1945 p 44
Power Supply Filter Design Radio News February 1945 p 38

Receivers, AM

Simple High Fidelity AM Tuner Radio News July '45 p 42
Improved Bass for small radios Electronics July '45 p 224

Receivers, FM

FM Frequency converter Radio News June '45 p 35
Adapting FM receivers to tune proposed FCC Allocation Electronics May '45 p 194

Recordings

Glossary of Disc Recording Terms Proceedings, IRE Nov. '45 p 760

Speakers

Speaker Enclosures Radio News July '45 p 49
Resonant Loudspeaker Enclosure Design Communications August '45 p 35
Loud Speaker Systems Radio News (Electronic Edition) June '45 p 3
A Note of Acoustic Horns Proceedings IRE July '45 p 447

Standards

Graphical Symbols for Electronic Designs Electronics August '45 p 12
Capacitor and Resistor Codes Radio-Craft May '45 p 493

Studio Design

Studio Acoustics Part 1 Radio News (Electronic Edition)
December 1945 p 2
" " Part 2 Radio News (Electronic Edition)
January 1946 p 8
Studio Facility Expansion Communications April '45 p 41
Acoustics of Small Rooms and Studios Electronics Feb. '45 p 286

Studio and Control Room Design Electronics August '45 p 126
(by IBS Technical Advisor Bill Hutchins. Reprints available
from IBS in New York.)
Cylinders for Better Sound Radio-Craft June '45 p 561
Broadcast News for January 1945 is almost entirely devoted to
articles on Polycylindrical Diffusing Treatment for studios.
FM Broadcast Stations FM & Television Nov '45 p 46

Transmitters

Broadcast Band Satellite Transmitters Electronics July '45 p 94
The Role of the Neutralizing Capacitor Communications Oct '45 p 52
Parasitic Oscillations Part I Radio-Craft July '45 p 631
" " Part II Radio-Craft August '45 p 700

Volume Indicators

Program Metering Circuits - Radio News (Electronic Edition)
April 1945 p 7

A Note on the Brush PL-20 Photo Pickup

Many IBS stations use the Brush Development Company pickup PL-20, a light-weight crystal type which plays 16" records. IBS Technical Advisor Bill Hutchins has been conducting a series of tests on many types of pickups, and recommends the PL-20. It is low priced, compared to other units of similar audio quality, and has good electrical and mechanical characteristics. The chief difficulty is that the crystal unit is frequently damaged in the brutal service that station equipment gets.

The crystals are easily replaced and will be repaired by the manufacturer. CURC, Columbia, uses four PL-20's and maintains two replacement crystals which are almost always at the factory being repaired.

According to Hutchins' tests the characteristics of the equalizer supplied by Brush were incorrectly given. The equalizer should be terminated in 50,000 ohms rather than in 500,000 as stated. This gives the proper equalization curve for commercial phonograph records. The equalization with the equalizer terminated in 500,000 ohms approaches the curve for transcriptions rather than records. Correct termination of the equalizer for records will result in a loss of volume, of course, which will have to be counteracted by increased amplification. A switch to change the loads for records or for transcriptions might be an advantage.

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